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7. Author(s) Carlos A. Comperatore, PhD; Pik Kwan Rivera				8. Performing Organization Report No. R&DC 209	
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16. Abstract (MAXIMUM 200 WORDS) This guide presents a formal program of practices (the Crew Endurance Management System) for controlling risk factors that affect crewmember performance and shipboard safety in the commercial maritime industry. The CEMS program is overviewed; a real-world example is provided; techniques for managing crewmember energy and performance levels are provided; operational risk factors affecting crewmember energy and performance levels are addressed; procedures for implementing a CEMS program are described; and supplementary materials are provided.					
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EXECUTIVE SUMMARY

Normal maritime operations expose crewmembers to a variety of operational risk factors, such as irregular work periods, temperature extremes, heavy workloads, and extended separations from family members. Left unmanaged, these risk factors can degrade crewmember endurance, and thereby both performance and safety levels.

In response to this situation, the U. S. Coast Guard has developed the Crew Endurance Management System (CEMS), a set of tools and practices maritime operators can use to manage productivity and safety levels in their operations. CEMS specifically helps operators identify the operational risk factors affecting crew endurance in particular situations, and to control these risk factors by means of proven practices and procedures.

These proven practices and procedures apply to the full scope of endurance management, not simply to sleep management. In other words, crew endurance management encompasses the full range of environmental, physiological, operational, and psychological risk factors affecting performance and safety in normal maritime operations.

Section I introduces the concept of Crew Endurance Management; Section II provides a quick, real-world example of a CEMS implementation; Section III describes how to use light-management techniques to match energy level with time-of-day workload; Section IV provides practical recommendations for controlling operational risk factors such as temperature extremes, stress, and caffeine use; and Section V describes how to design, implement, and evaluate CEM plans aboard maritime vessels.